

23

Public Health Infrastructure

Co-Lead Agencies: Centers for Disease Control and Prevention;
Health Resources and Services Administration

Contents

Goal	3
Overview	3
Issues and Trends	3
Disparities	5
Opportunities.....	6
Interim Progress Toward Year 2000 Objectives	7
Healthy People 2010—Summary of Objectives	8
Healthy People 2010 Objectives	9
Data and Information Systems	9
Workforce	14
Public Health Organizations	16
Resources.....	19
Prevention Research	20
Related Objectives From Other Focus Areas	21
Terminology	21
References	23

Goal

Ensure that Federal, Tribal, State, and local health agencies have the infrastructure to provide essential public health services effectively.

Overview

The mission of public health is to fulfill A society's interest in assuring conditions in which persons can be healthy.^{@1} Public health engages both private and public organizations and individuals in accomplishing this mission. Responsibilities encompass preventing epidemics and the spread of disease, protecting against environmental hazards, preventing injuries, encouraging healthy behavior, helping communities to recover from disasters, and ensuring the quality and accessibility of health services.

Issues and Trends

The Nation's public health infrastructure has three components: the people who work in the field of public health, the information and communication systems used in collecting and disseminating accurate data, and the public health organizations at the State and local levels that are in the front lines of public health. The public health infrastructure is a complex web of practices and organizations that has been characterized as in A disarray.^{@1, 2}

Public health encompasses three core functions: *assessment* of information on the health of the community, comprehensive public health *policy development*, and *assurance* that public health services are provided to the community.¹ These functions have been defined further and expanded into 10 essential public health services.² (See chart for full list from the *Public Health in America* statement.³) The totality of the public health infrastructure includes all governmental and nongovernmental entities that provide any of these services. Environmental health, occupational health and safety, mental health, and substance abuse are integral parts of public health. Service providers, such as managed care organizations, hospitals, nonprofit corporations, schools, faith organizations, and businesses, also are an integral part of the public health infrastructure in many communities.

Various reports and evaluations have described the continuing deterioration of the national public health system: health departments are closing, technology and information systems are outmoded, emerging and drug-resistant diseases threaten to overwhelm resources, and serious training inadequacies weaken the capacity of the public health workforce to address new threats and adapt to changes in the health care market.^{1, 4} Conversely, interest in public health has led to the development of public health improvement plans in several States, including Illinois and

Washington. In addition, private foundations have funded major national programs to improve health. For example, Turning Point: Collaborating for a New Century of Public Health Initiatives, supported by the Robert Wood Johnson Foundation and the W.K. Kellogg Foundation, helps develop more effective public health infrastructure by providing technical assistance to health departments at State and local levels.

All public health services depend on the presence of basic infrastructure. Every categorical public health program—childhood immunizations, infectious disease monitoring, cancer and asthma prevention, drinking water quality, injury prevention and many others—requires health professionals who are competent in cross-cutting and technical skills, public health agencies with the capacity to assess and respond to community health needs, and up-to-date information systems. Federal public health agencies rely on the presence of infrastructure systems at the local and State levels to support the implementation of their programs.

In public health, a strong infrastructure provides the capacity to prepare for and respond to both acute and chronic threats to the Nation's health, whether they are bioterrorism attacks, emerging infections, disparities in health status, or increases in chronic and injury rates. Such an infrastructure serves as the foundation for planning, delivering, and evaluating public health. The public health infrastructure comprises data and information systems, the workforce, and public health organizations. Research also is a key activity of public health infrastructure in identifying opportunities to improve health, strengthen information systems and organizations, and make more effective and efficient use of resources.

Health data and surveillance systems provide information on illness, disability, and death from acute and chronic conditions; injuries; personal, environmental, and occupational risk factors; preventive and treatment services; and costs. To be most useful, public health data must be accessible, accurate, timely, and clearly stated and must adhere to strict confidentiality standards. The system must be linked with other data systems and must be linked with and integrated at the Federal, Tribal, State, and local levels. The systematic collection, analysis, interpretation, dissemination, and use of health data drive efforts to determine the health status of a population, plan prevention programs, and evaluate program effectiveness. Healthy People activities during the 1980s and 1990s have demonstrated the central role of data, focused attention on what is important to measure, and stimulated the development of new data systems.

Although Federal agencies take the lead in collecting national public health data, they are only some of the many necessary partners that collect, analyze, and use public health data. Surveillance often involves active cooperation among Federal, Tribal, State, and local agencies. For example, the Vital Statistics Cooperative Program obtains information on births, deaths, marriages, and divorces from all 50 States, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. Programs in each area collect vital information from many sources in local

communities, including funeral directors, medical examiners, coroners, hospitals, religious authorities, and justices of the peace. Other data collection systems, based on sample surveys rather than reports, depend on the participation of thousands of private citizens nationwide. And still other systems rely on the administrative records of public and private health care organizations.

If data are not available or are missing, problems can arise, especially for State and local health agencies. In particular, health problems may not be identified in high-risk populations, or the public intervention may not be timely enough. Information enables public health to direct preventive services and health promotion activities toward select populations.

The public health workforce must have up-to-date knowledge, skills, and abilities to deliver services effectively and carry out the core functions of assessment, policy development, and assurance of services. The importance of organizations in making a system effective often is overlooked. Yet, Tribal, State and local public health agencies, in partnership with other community organizations, are essential to an effective public health system.

Because a national data system will not be available in the first half of the decade for tracking progress, one subject of interest concerning the public health infrastructure is not covered in this focus area's objectives. This topic represents a research and data collection agenda for the coming decade: increasing the proportion of Federal, Tribal, State, and local public and private employers that voluntarily adopt the Standard Occupational Classification (SOC) system to categorize public health personnel.

Disparities

A major goal of Healthy People 2010 is to eliminate health disparities.⁶ These disparities exist at all State and local levels but are not well delineated because of differences in public health systems. Improved data and information systems, a better trained public health workforce, and more effective public health organizations will strengthen the public health infrastructure at all levels and help identify where disparities exist. Then targeted interventions and programs to eliminate the disparities can be developed.

Disparities among public health organizations and between the public and private health sectors are also of concern. For example, a diverse, highly skilled workforce must be recruited and trained to meet the challenges of the 21st century. Salary structures and disparities in staffing across jurisdictions, as well as between workers in the public and private sectors, will affect the ability of public health agencies to recruit and retain a high-quality workforce.

Opportunities

Several developments suggest opportunities to improve public health capacity nationwide.

The 1997 report *Public Health Workforce: An Agenda for the 21st Century* recognized the need for a system to assure a stronger public health workforce.⁵ The report identified five areas to be strengthened: national leadership, State and local leadership, workforce composition, curriculum development, and distance learning. Data systems are needed to track the extent to which the workforce has the

Essential Public Health Services

1. Monitor health status to identify community health problems.
2. Diagnose and investigate health problems and health hazards in the community.
3. Inform, educate, and empower people about health issues.
4. Mobilize community partnerships to identify and solve health problems.
5. Develop policies and plans that support individual and community health efforts.
6. Enforce laws and regulations that protect health and assure safety.
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable.
8. Assure a competent public health and personal health care workforce.
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services.
10. Research for new insights and innovative solutions to health problems.

Source: Public Health Function Steering Committee. *Public Health in America*, Fall 1994. www.health.gov/phfunctions/public.htm (January 1, 2000).

knowledge, skills, and abilities to carry out its functions. With wide input from the public health community, the Standard Occupational Classification system was updated in 1997 and 1998 to include an array of public health professions.⁶ SOC will continue to be used in a number of national population- and employer-based surveys by the Bureau of Labor Statistics (U.S. Department of Labor), the Bureau of the Census (U.S. Department of Commerce), and the Bureau of Health Professions (U.S. Department of Health and Human Services). A standard classification may be useful in determining minimum levels of competency for each classification.

Interim Progress Toward Year 2000 Objectives

Healthy People 2000 did not have a specific focus area for public health infrastructure. Two objectives, however, did address broad infrastructure areas. One stated, AIncrease to at least 90 percent the proportion of persons who are served by a local health department that is effectively carrying out the core functions of public health.@ Although selected studies have provided a snapshot of local health department effectiveness in carrying out the core functions,^{7, 8} systematic monitoring of this objective over time has not been done. However, efforts to define, achieve, and measure this objective have contributed to a more complete description of infrastructure as well as a more detailed and expanded infrastructure goal.

The second objective stated, AIncrease to at least 50 percent the proportion of counties that have established culturally and linguistically appropriate community health promotion programs for racial and ethnic minority populations.@

In 1996-97, baseline data for this objective were obtained for local health departments serving certain racial and ethnic groups comprising 10 percent or more of the population. Programs or interventions were most likely to be adapted in the areas of maternal and infant health (47 percent), nutrition (44 percent), and family planning (42 percent). Adaptations were least likely to have been made by such groups in the areas of occupational safety and health (13 percent), mental health and mental disorders (18 percent), and food and drug safety and health (18 percent).

Healthy People 2000 had a specific focus area on data and surveillance. Several objectives from this chapter have been modified and are included in the data and information systems section below.

Of the seven surveillance and data system objectives, progress has been made on six. A set of health status indicators appropriate to Federal, State, and local levels was developed, and all States monitor at least some indicators. National data sources to measure progress toward each of the Healthy People 2000 objectives were identified or created for 97 percent of objectives. Although difficult to quantify, progress toward filling data gaps is continuing, most recently through the *Healthy People 2000 Midcourse Review and 1995 Revisions* when considerable attention was given to population groups at highest risk for premature death, disease, or disability. The number of States that periodically publish data on Healthy People 2000 objectives has increased substantially. Systems for the transfer of data have expanded considerably in all States, with the expansion of the Internet playing a major role. Achieving the timely release of data appears to have moved away from the target; however, the measurement of progress for this objective is affected by the frequency of data collection.

Note: Unless otherwise noted, data are from Centers for Disease Control and Prevention, National Center for Health Statistics, *Healthy People 2000 Review*, 1998-99.

Healthy People 2010—Summary of Objectives

Public Health Infrastructure

Goal: Ensure that Federal, Tribal, State, and local health agencies have the infrastructure to provide essential public health services effectively.

Number	Objective
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Data and Information Systems

- | | |
|------|--|
| 23-1 | Public health employee access to Internet |
| 23-2 | Public access to information and surveillance data |
| 23-3 | Use of geocoding in health data systems |
| 23-4 | Data for all population groups |
| 23-5 | Data for Leading Health Indicators, Health Status Indicators, and Priority Data Needs at Tribal, State, and local levels |
| 23-6 | National tracking of Healthy People 2010 objectives |
| 23-7 | Timely release of data on objectives |

Workforce

- | | |
|-------|---|
| 23-8 | Competencies for public health workers |
| 23-9 | Training in essential public health services |
| 23-10 | Continuing education and training by public health agencies |

Public Health Organizations

- | | |
|-------|--|
| 23-11 | Performance standards for essential public health services |
| 23-12 | Health improvement plans |
| 23-13 | Access to public health laboratory services |
| 23-14 | Access to epidemiology services |
| 23-15 | Model statutes related to essential public health services |

Resources

- | | |
|-------|------------------------------------|
| 23-16 | Data on public health expenditures |
|-------|------------------------------------|

Prevention Research

- | | |
|-------|---------------------|
| 23-17 | Prevention research |
|-------|---------------------|

Healthy People 2010 Objectives

Data and Information Systems

- 23-1. (Developmental) Increase the proportion of Tribal, State, and local public health agencies that provide Internet and e-mail access for at least 75 percent of their employees and that teach employees to use the Internet and other electronic information systems to apply data and information to public health practice.**

Potential data sources: National Association of County and City Health Officials (NACCHO); Association of State and Territorial Health Officials (ASTHO); National Public Health Performance Standards Program (PHPPO), CDC; IHS.

Unpublished data from a 1999 survey of the National Association of County and City Health Officials showed 49 percent of local health department directors had continuous, high-speed access to the Internet at work. Further, 83 percent of local health departments had staff members who can search for and access public information on the Internet. The Bioterrorism Initiative, which began in 1999, is expected to generate information on Internet and e-mail capacity at State and local levels for responding to terrorist events; this information could be used in monitoring this objective.

All workers within a State or local public health agency need access to the Internet or other electronic information systems appropriate to their job functions. Access requires hardware (for example, computers, modems, CD-ROM drives), software that can browse the Internet and can be used to analyze health information databases, and training on the effective use of the Internet and database systems. Adequate capacity in public health informatics—the systematic application of information and computer science and technology to public health practice, research, and learning—is key to this objective. Public health agencies need to provide appropriate training on data sources and how to transform the data retrieved from these systems into information that can be used to develop public health policy.

23-2. (Developmental) Increase the proportion of Federal, Tribal, State, and local health agencies that have made information available to the public in the past year on the Leading Health Indicators, Health Status Indicators, and Priority Data Needs.

Potential data sources: CDC, NCHS; National Association of County and City Health Officials (NACCHO); Association of State and Territorial Health Officials (ASTHO); National Public Health Performance Standards Program (PHPPO), CDC; IHS.

Leading Health Indicators are defined elsewhere in *Healthy People 2010*. Health Status Indicators and Priority Data Needs are those generated from objective 22.1 in *Healthy People 2000*.^{9, 10} This objective seeks to ensure that data collected at the National, State, and local levels are electronically aggregated and available to and accessible by individuals and organizations. The objective includes publicly accessible communication through media (for example, print, television, and radio) or online systems, such as the Internet. In addition to data on Leading Health Indicators, Health Status Indicators, and Priority Data Needs, many other kinds of public health data need to be accessible to the public. These data include health outcomes; utilization statistics, such as the Health Plan Employer Data and Information Set (HEDIS) or similar measures from managed care organizations; infrastructure data; health risk data; and community report cards that provide a snapshot of a community's health. Efforts should be made to include other sources of data not widely used for public health assessment (for example, sources of socioeconomic, expenditures, and quality of life data).

23-3. Increase the proportion of all major National, State, and local health data systems that use geocoding to promote nationwide use of geographic information systems (GIS) at all levels.

Target: 90 percent.

Baseline: 45 percent of major National, State, and local health data systems geocoded records to street address or latitude and longitude in 1999.

Target setting method: 100 percent improvement.

Data source: CDC, NCHS.

Public health rests on information. The information technology revolution, including online systems, the Internet, and other electronic information systems, continues to expand both the volume and the accessibility of information. Increased use of geocoding in health data systems will provide the basis for more cost-effective disease surveillance and intervention. At the same time, challenges arise in synthesizing and disseminating the huge amount of available information, as well as

ensuring that the data are scientifically accurate and have appropriate safeguards for confidentiality.

The capacity to achieve national goals is related to the ability to target strategies to geographic areas.¹¹ Extension of geocoding capacities throughout health data systems will facilitate this ability. A geographic information system is a powerful tool combining geography, data, and computer mapping. With GIS, digital maps and databases are stored with linked georeferenced identifiers to facilitate rapid computer manipulation, analysis, and spatial display of information. Geocoding (street address matching or assignment of latitude and longitude) will be the basis for data linkage and analysis in the 21st century. The versatility of GIS supports the exploration of spatial relationships, patterns, and trends that otherwise would go unnoticed.¹² In 1999, 10 of 22 major health data systems, defined as data systems responsible for tracking 5 or more Healthy People 2010 objectives, geocoded data. However, public access to data below the county level is prohibited or severely restricted because of confidentiality and privacy issues. A major challenge in the coming decade will be to increase public access to GIS information without compromising confidentiality.¹³ (See Volume III, Part C, for a discussion of these major health data systems.)

23-4. Increase the proportion of population-based Healthy People 2010 objectives for which national data are available for all population groups identified for the objective.

Target: 100 percent.

Baseline: 10 percent of the population-based objectives had national data for all select population groups in 1999.

Target setting method: Total coverage.

Data source: CDC, NCHS.

The capacity of the public health system to measure the health of all individuals requires special attention to groups that may not be identifiable in statewide or national databases. Lack of data for these groups can be the result of relatively small numbers of cases for rare events, small population groups, or other special circumstances. Better data-gathering systems are needed to track health objectives for such populations as racial and ethnic groups, persons with disabilities, specific Tribes, homeless persons, institutionalized persons (for example, in nursing homes and prisons), low-income persons, and students in special education.

National data indicate that some racial and ethnic groups often face higher rates of illness, disability, death, or other risk factors than the general population. Other groups, such as persons with low incomes, limited education, or disabilities, also have relatively poor health. Females and males also experience the burden of poor

health in different ways. One of the overarching goals of Healthy People 2010 is to eliminate these health disparities. To assess progress toward this goal, data on population groups must be available.

23-5. (Developmental) Increase the proportion of Leading Health Indicators, Health Status Indicators, and Priority Data Needs for which data—especially for select populations—are available at the Tribal, State, and local levels.

Potential data sources: CDC, NCHS; IHS.

In 1997, 37 of 47 States and the District of Columbia had their own Healthy People 2000 plans.¹⁴ The average number of objectives in the State plans was 113 but ranged from 20 to 308.¹⁴ On average, baseline data were available for 76 percent of the States= objectives by 1997, although more than half of the data were 3 or more years old.¹⁴

Because of the lack of comparability between States, a set of Leading Health Indicators has been developed from the Healthy People 2010 objectives. These indicators can be monitored at the National, State, and local levels. They can be used in conjunction with States= objectives to evaluate the progress of Healthy People 2010 in communities.

Health Status Indicators and Priority Data Needs are those generated from objective 22.1 in Healthy People 2000.^{9, 10} Select populations are those identified for each indicator that make up at least 10 percent of the population for the Tribal, State, or local area. State and local data are essential for the managers and providers who must assess health status and services and plan, carry out, and evaluate health programs. However, data were not available for all objectives at all State and local levels to evaluate the majority of Healthy People 2000 objectives. Therefore, a consensus process identified a small set of indicators that would be understandable, acceptable, outcome oriented, and measurable with available data and would imply specific interventions that compel action.⁹ This process resulted in the set of Health Status Indicators. National data for these indicators are published regularly in the *Healthy People 2000 Review*.¹⁵

An additional set of measures was considered that had important public health significance but could not be included because of insufficient data at the State and local levels. This set, known as Priority Data Needs, has been used to measure these additional indicators.¹⁰ (State data are available for both the Health Status Indicators and Priority Data Needs at www.cdc.gov/nchswww/datawh/datawh.htm.)

An important function of these different sets of health indicators is to monitor progress toward the second goal of Healthy People 2010: to eliminate health disparities among population groups. Data for these indicators need to be available at

the National, Tribal, State, and local levels. The objective's intent is to ensure the availability of sufficient and accurate data to evaluate these indicator sets at all geographic levels and for all select population groups.

23-6. Increase the proportion of Healthy People 2010 objectives that are tracked regularly at the national level.

Target: 100 percent.

Baseline: 59 percent of objectives are tracked every 3 years (preliminary data).

Target setting method: Total coverage for population-based objectives.

Data source: CDC, NCHS.

Frequent, regular feedback is needed to tailor strategies to achieve national objectives during a decade. Past efforts have been hampered by infrequent tracking of objectives. For adequate tracking of the objectives during the next decade, at least three data points (baseline, midpoint, final) are desirable to assess progress. Hence, objectives need to be measured at least every 3 years. Currently, 48 percent (preliminary data) of the objectives are tracked annually.

Healthy People 2010 contains more than 150 developmental objectives that lack baseline data at initial publication. Healthy People will succeed and lead to action only to the extent that regularly collected data can be used to track its objectives.

23-7. Increase the proportion of Healthy People 2010 objectives for which national data are released within 1 year of the end of data collection.

Target: 100 percent.

Baseline: 27 percent of the objectives measured by major data sources were tracked with data released within 1 year of the end of data collection in 1999 (preliminary data).

Target setting method: Total coverage (as measured by major data systems).

Data source: CDC, NCHS.

The utility of data depends on both the periodicity of data collection (see objective 23-6) and the timeliness of data release. In past years, a number of electronic data collection systems have been put in place in National, Tribal, State, and local data collection agencies (for example, electronic birth and death certificates, computer-assisted personal interview questionnaires, and computer-assisted telephone interview questionnaires). Some of these innovations, such as vital statistics data from electronic birth and death certificates, already are showing results in the more timely release of data. For others, the benefits of faster turnaround are still a few

years away. The purpose of this objective is to ensure that health information is available to policymakers and the public shortly after data collection.

Workforce

23-8. (Developmental) Increase the proportion of Federal, Tribal, State, and local agencies that incorporate specific competencies in the essential public health services into personnel systems.

Potential data sources: National Association of County and City Health Officials (NACCHO); Association of State and Territorial Health Officials (ASTHO); HRSA; IHS.

In addition to a basic knowledge of public health, all public health workers should have specific competencies in their areas of specialty, interest, and responsibility. Competent leaders, policy developers, planners, epidemiologists, funders, evaluators, laboratory staff, and others are necessary for a strong public health infrastructure. The workforce needs to know how to use information technology effectively for networking, communication, and access to information. A skilled workforce must be culturally and linguistically competent to understand the needs of and deliver services to select populations and to have sensitivity to diverse populations. Finally, technical competency in such areas as biostatistics, environmental and occupational health, the social and behavioral aspects of health and disease, and the practice of prevention in clinical medicine should be developed in the workforce.

Although the disciplines in a particular agency will vary according to the resources, policies, needs, and populations served, individual public health employees must have certain competencies or levels of expertise. Their combined areas of expertise enable the organization to provide essential public health services. Failure to include references to these competencies in the formal personnel system makes achieving standards difficult. Position descriptions or performance evaluations are likely sources of data for this objective.

National licensing and certification programs that measure competency already exist for nurses, physicians, dietitians, health educators, laboratory technicians, sanitarians, environmental health specialists, and many allied health professionals. Coordination with these national programs will be important to ensure that new certification efforts cover essential public health service concerns. At least one State, New Jersey, has licensing requirements for all local health officers.

23-9. (Developmental) Increase the proportion of schools for public health workers that integrate into their curricula specific content to develop competency in the essential public health services.

Potential data sources: Association of Schools of Public Health; American Association of Medical Colleges; Schools of Nursing; American Association of Colleges of Nursing.

23-10. (Developmental) Increase the proportion of Federal, Tribal, State, and local public health agencies that provide continuing education to develop competency in essential public health services for their employees.

Potential data sources: National Association of County and City Health Officials (NACCHO); Association of State and Territorial Health Officials (ASTHO); HHS.

The above two objectives address training for both the current and future public health workforce. Tomorrow's public health workforce is being educated today by schools of public health, programs in public health accredited by the Council on Education for Public Health, and other graduate programs. These emerging leaders must be grounded in the areas of expertise needed to deliver essential public health services. This objective may be accomplished either by developing specific courses or by incorporating essential public health services into existing offerings, depending on the school or program.

There is an ongoing need to train and educate those currently employed in public health as new areas, problems, threats, and potential disasters emerge. For example, the threat of bioterrorism or the increased impact of any natural and technological disaster will require different training and areas of expertise so that public health workers can detect problems early, communicate rapidly, and respond effectively. A system for enabling career-long learning opportunities is desirable.

Although several disciplines have continuing education requirements as part of the licensing or certification process, this objective extends to all workers. Federal, Tribal, State, and local public health agencies do not necessarily have to provide the education, but they need to ensure its availability to employees. Employees in organizations that are not formally part of the public health system but that deliver health services also should have continuing education. Once an effective source of data is developed for this objective, a percentage of employees should be targeted annually for continuing education.

Public Health Organizations

23-11. (Developmental) Increase the proportion of State and local public health agencies that meet national performance standards for essential public health services.

Potential data source: National Public Health Performance Standards Program (PHPPO), CDC.

Experts in quality improvement have long asserted that what gets measured gets done.¹⁶ The measurement of performance is not new, nor is the concept foreign to most health departments. What is not being done, however, is comprehensive, systematic performance evaluation. Without standard performance indicators and systematic comparisons, public health lacks useful benchmarks for improvement. National performance standards could be used to improve quality, increase accountability for dollars invested, and create credibility with internal and external constituents. National organizations, such as the Joint Commission on Accreditation of Healthcare Organizations and the National Commission on Quality Assurance, that work with performance measures in health care have models that can be followed.

A number of States have or are developing State-specific performance standards for local public health agencies. CDC, in conjunction with National, State, and local public health organizations, is developing national performance standards for State and local health departments.¹⁷ These national standards, expected to be operational in 2000, are based on the essential public health services.

23-12. Increase the proportion of Tribes, States, and the District of Columbia that have a health improvement plan and increase the proportion of local jurisdictions that have a health improvement plan linked with their State plan.

Objective	Jurisdiction	1997 Baseline	2010 Target
		(unless noted) Percent	
23-12a.	Tribes	Developmental	
23-12b.	States and the District of Columbia	79	100
23-12c.	Local jurisdictions	32 (1992-93)	80

Target setting method: Total coverage for Tribes, States, and the District of Columbia; 150 percent improvement for local jurisdictions.

Data sources: National Profile of Local Health Departments, National Association of County and City Health Officials (NACCHO); Association of State and Territorial Health Officials (ASTHO); IHS.

Planning is central to improving public health in any State or community. A health improvement plan (HIP) is a long-term, systematic effort to address health problems on the basis of the results of a community needs assessment. This plan is used by health and other governmental education and human service agencies, in collaboration with community partners, to set priorities and coordinate and target resources.

A HIP is critical for developing policies and defining actions to target efforts that promote health. It should define the vision for the health of the community inclusively and should be done in a timely way. Many States and localities have their own HIPs that may not be related to one another. Public health needs often exceed resources, and sufficient resources are never available. The health of a State or local community can be improved by setting priorities so available resources are used more efficiently.

Health improvement plans are, or should be, the link between Healthy People 2010 and the unique health needs of each State and local area. Plans should include all community interests and should tie health goals to other State goal-setting or bench-marking processes. Plans also will identify collaboration among partners to facilitate implementation and evaluation. State and local health departments have a leadership role in this process.

23-13. (Developmental) Increase the proportion of Tribal, State, and local health agencies that provide or assure comprehensive laboratory services to support essential public health services.

Potential data sources: CDC; Association of Public Health Laboratories; Association of State and Territorial Health Officials (ASTHO); National Association of County and City Health Officials (NACCHO).

Public health laboratories, in conjunction with clinical, environmental, and agricultural laboratories, constitute a national laboratory network that fulfills a critical role in assessing and assuring the health of populations and the environment. This role includes such activities and services as laboratory quality assessment and improvement, outbreak investigation, emergency preparedness and response, laboratory-based surveillance, population screening, and technology transfer. The national laboratory network also operates for the benefit of public health by helping to assure safe water, food, and air and by supporting programs such as newborn screening and lead-poisoning prevention.

23-14. (Developmental) Increase the proportion of Tribal, State, and local public health agencies that provide or assure comprehensive epidemiology services to support essential public health services.

Potential data sources: Council of State and Territorial Epidemiologists; IHS.

All communities need access to comprehensive epidemiology services so they can quickly detect, investigate, and respond to diseases in order to prevent unnecessary transmission. Epidemiologists carry out several essential public health services, including monitoring health status, diagnosing and investigating health problems and health hazards, and conducting evaluation and research.

23-15. (Developmental) Increase the proportion of Federal, Tribal, State, and local jurisdictions that review and evaluate the extent to which their statutes, ordinances, and bylaws assure the delivery of essential public health services.

Potential data sources: National Conference of State Legislators; Association of State and Territorial Health Officials (ASTHO); National Association of County and City Health Officials (NACCHO); IHS.

The legal basis for any public health agency is the statutes, ordinances, and charters that create the agency and set forth its powers and duties. General language in such a document usually states the agency's responsibility to preserve, promote, and protect the health of the persons in its jurisdiction. In addition, the agency usually is authorized to enforce multiple statutes that require it to control diseases (or classes of diseases), limit certain kinds of businesses (for example, restaurants and health facilities), and monitor the treatment of waste materials (for example, sewage and garbage). These authorities may be centralized in one agency or distributed across several. A review of State public health statutes shows significant variation from the accepted framework of the essential public health services.¹⁸ As might be expected due to their antiquity, little correlation exists between current statutes and the essential public health services identified in the mid-1990s.

Many laws, rules, regulations, and ordinances pertaining to public health are outmoded. Federal, Tribal, State, and local jurisdictions need to review their public health laws and consider a different conceptual approach for regulating public health. Rather than have a legal structure based on the provision of services for categorical health problems, communities might be better served and protected by a set of laws, statutes, and ordinances based on essential public health services. Without diminishing the role of each jurisdiction in tailoring a statute (ordinance, charter, or regulation) to local conditions and priorities, the Nation's public health infrastructure would be strengthened if jurisdictions had a model law and could use it regularly for improvements. Such a model should be developed and should contain examples of complete statutory language for key principles and provisions (such as establishment of agency powers, authority of agency director, surveil-

lance for conditions of public health importance, due process in enforcement actions to protect the public's health) and examples for drafting any other portion of the law.

Resources

23-16. (Developmental) Increase the proportion of Federal, Tribal, State, and local public health agencies that gather accurate data on public health expenditures, categorized by essential public health service.

Potential data sources: National Association of County and City Health Officials (NACCHO); Association of State and Territorial Health Officials (ASTHO); HHS, Operating Divisions; IHS.

Financial resources fuel the public health infrastructure. Understanding the Nation's investment in public health and the origin and destination of these financial resources is critical. To allocate resources appropriately and to ensure efficient performance, expenditures must be documented and explained. Documenting finances will allow communities to identify gaps in expenditures that they can help fill in partnership with public health agencies. State and local leaders need to know where gaps exist and how funding is changing in order to ensure that public health agencies can protect the Nation's health.

The Public Health Expenditures Project estimated and aggregated expenditures by Federal agencies and State health departments on the essential public health services.¹⁹ The purpose was to understand the capacity to collect such data, apart from specific programmatic expenditures. Considerable difficulty was encountered during the project because expenditure information is not usually collected using this framework. Reporting requirements are different for different program areas and for different funding streams.

The Public Health Foundation (PHF) led a study of eight States that estimated expenditures by essential public health service.¹⁹ A joint study by the National Association of County and City Health Officials, National Association of Local Boards of Health, and PHF reported the feasibility of collecting expenditure data by essential public health service at the local level.²⁰ These studies showed that reliable estimates of expenditures based on essential public health services can be produced, but that measuring investment in essential services must be integrated into existing data collection strategies and emerging initiatives.

A national perspective on the expenditure of financial resources related to essential public health services will help in allocating resources on a functional rather than a programmatic basis and in identifying where additional resources may be

needed to assure a strong infrastructure at the Federal, Tribal, State, and local levels.

Prevention Research

23-17. (Developmental) Increase the proportion of Federal, Tribal, State, and local public health agencies that conduct or collaborate on population-based prevention research.

Potential data sources: Association of Schools of Public Health; National Association of County and City Health Officials (NACCHO); Association of State and Territorial Health Officials (ASTHO); CDC Sentinel Network.

Research is the Nation's investment in the future. Public health research is both funded and conducted by Federal, State, and local public health agencies, academic institutions, private industry, and philanthropic institutions. Opportunities and incentives should be provided to attract new researchers and to encourage collaboration among Federal agencies, States, local communities, and academic institutions. These efforts should result in a research agenda for the Nation's public health infrastructure. The Federal Government has a strong commitment to health research, as evidenced by the billions of dollars allocated to the National Institutes of Health, the Centers for Disease Control and Prevention, the Agency for Healthcare Research and Quality, the Health Resources and Services Administration, and other U.S. Public Health Service agencies. State governments, private foundations, and private industry also are strong supporters of research. Most resources have been directed toward biomedical research, with more focus on individual diseases or risk factors than on population-based prevention.

Researchers and research organizations now recognize the value of including diverse populations and communities in their studies. Population-based prevention and clinical research must continue to include specific population groups, such as females, racial and ethnic groups, and persons who are either not served or are underserved. Research should be responsive to National, State, and local public health priorities and needs.

Strengthening the capacity to conduct population-based research is essential for improving the practice of public health. Research is defined by the *Code of Federal Regulations* as "a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge."²¹ The primary goal of population-based public health research is to collect information that will form the basis for public health action.²² Thus, the areas included in population-based public health research are public health surveillance, program evaluation, emergency response, and evidence-based guideline development and dissemination.

National, State, and local agencies and organizations conducting research require the collaboration and cooperation of the population being studied. Formal collaboration (such as a memorandum of agreement) between schools of public health and State or local health departments for the conduct of a specific project could be a measure for this objective.

Related Objectives From Other Focus Areas

1. Access to Quality Health Services

- 1-7. Core competencies in health provider training
- 1.8. Racial and ethnic representation in health professions

6. Disability and Secondary Conditions

- 6-1. Standard definition of people with disabilities in data sets
- 6.13. Surveillance and health promotion programs

7. Educational and Community-Based Programs

- 7-10. Community health promotion programs
- 7-11. Culturally appropriate community health promotion programs

8. Environmental Health

- 8-26. Information systems used for environmental health

11. Health Communication

- 11-1. Households with Internet access
- 11-3. Research and evaluation of health communication programs
- 11-4. Quality of Internet health information sources
- 11-5. Centers of excellence

17. Medical Product Safety

- 17-2. Linked, automated information systems

21. Oral Health

- 21-16. State-based surveillance system

Terminology

(A listing of all abbreviations and acronyms used in this publication appears in Appendix K.)

Distance learning: A system and a process that connects learners with distributed learning resources characterized by: (1) separation of place or time between instructor and learner, among learners, or between learners and learning resource and (2) interaction between the learner and the instructor, among learners, or between learners and

learning resources conducted through one or more media. Use of electronic media is not required.

Epidemiology: Branch of medical science dealing with the distribution and determinants of health-related events in specified populations and the application of this study to the control of health problems.

Essential public health services: The services identified in *Public Health in America* (defined below):

monitoring health status; diagnosing and investigating health problems; informing, educating, and empowering people; mobilizing community partnerships; developing policies and plans; enforcing laws and regulations; linking people to needed services; assuring a competent workforce; conducting evaluations; and conducting research.

Federal, State, or local public health agency: A government or nongovernment entity authorized to

provide one or more essential public health services. Included are health, mental health, substance abuse, environmental health, occupational health, educational, and public health agencies.

Geocoding: The process of address matching and assignment of a street address to a corresponding latitude and longitude.

Geographic information system (GIS): Combines modern computer and supercomputing digital technology with data management systems to provide tools for the capture, storage, manipulation, analysis, and visualization of spatial data. Spatial data contain information, usually in the form of a geographic coordinate system, that gives the data location relative to the earth's surface. These spatial attributes enable previously disparate data sets to be integrated into a digital mapping environment.

Graduate program in public health: Any academic post bachelor's degree program that specifically trains public health workers. Included, for example, are programs in schools of public health, nursing, environmental health, medicine and dentistry, and veterinary medicine.

Health improvement plan (HIP): A plan made up of action steps to guide providers of essential public health services in addressing problems and gaps that have been identified in a needs assessment. A local plan should be linked to its State plan. Both plans should mobilize a variety of organizations to reduce health problems and improve the community's capacity to respond to public health needs. All providers of public health services—such as health departments, hospitals, schools, managed care

providers under Medicaid, environmental health agencies, and medical and nursing organizations—should be included in a HIP. Health departments should play an especially active role in developing and implementing plans.

Health Status Indicators: Eighteen measures of health status defined in 1991 that represent a broad overview of a community's health and that can be used by various levels of government. Health Status Indicators include infant mortality, death rates for selected diseases, incidence rates of selected infectious diseases, measures regarding pregnancy and birth, childhood poverty, and air quality.

Leading Health Indicators: A set of 10 key determinants that influence health and can serve as a barometer for evaluating the health of the Nation. Leading Health Indicators include individual behaviors, the social and physical environment, and community health programs and address areas that most influence the health of individuals, communities, and the Nation.

Major health data systems: Data systems that provide tracking data for six or more national Healthy People 2010 objectives, including the Vital Statistics Cooperative Program, National Health Interview Survey, National Health and Nutrition Examination Survey, National Hospital Discharge Survey, and Behavioral Risk Factor Surveillance System.

Needs assessment: A formal process—which is the first step in a community health improvement process—of identifying problems and assessing the community's capacity to address health and social service needs. Examples include Assessment Protocol for

Excellence in Public Health, Planned Approach to Community Health, Healthy Cities, and Model Standards.

Population-based prevention research: Research to identify effective public health prevention practices for particular populations.

Priority Data Needs: Sixteen measures of health status and risk behaviors of public health significance that were not included in the 1991 list of Health Status Indicators because of insufficient data at all levels of government. Subsequent to 1991, data sources have been developed for most of the Priority Data Needs. Priority Data Needs include indicators of selected chronic diseases, access to medical care, environmental exposures, and behavioral risks.

Public health and environmental health laboratory services: Laboratory services that include health and environmental assessment, surveillance, quality assurance, training, and consultation. These services also include a core set of tests in pathology, hematology, chemistry, microbiology, and environmental science.

Public Health in America: Statement that defines the public health vision and mission and describes the essential public health services. It was adopted in 1994 by the Public Health Functions Steering Committee, which included representatives of the U.S. Public Health Service agencies, American Public Health Association, Association of Schools of Public Health, Association of State and Territorial Health Officials, Environmental Council of the States, National Association of County and City Health Officials, National Association of State Alcohol and Drug Abuse Directors, National Association of State

Mental Health Program Directors, and Public Health Foundation.

Public health informatics:

The systematic application of information and computer science and technology to public health practice, research, and learning.

Public health infrastructure:

The resources needed to deliver the essential public health services to every community--people who work in the field of public health, information and communication systems used to collect

and disseminate accurate data, and public health organizations at the State and local levels in the front lines of public health.

Public health workers:

Individuals who are responsible for providing the essential public health services whether or not they work in an official health agency. At the State level, many workers have public health responsibilities even though they may work for nonpublic health agencies, such as environmental, agricultural, and education departments.

This definition does not include those workers who occasionally contribute to the public health effort while fulfilling other responsibilities. Public health workers also are defined in the SOC system used by the Bureau of Labor Statistics, Bureau of the Census, and Bureau of Health Professions. This system has been updated and expanded to include additional categories of public health workers.

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